CLAIMS

1. A process for manufacturing acrylic acid from propane, wherein:

a) a gas mixture free from molecular oxygen and comprising propane, water vapour, as well as, if appropriate, an inert gas, is introduced into a first reactor with a moving catalyst bed,

b) at the outlet of the first reactor, the gases are separated from the catalyst;

c) the catalyst is returned into a regenerator;

d) the gases are introduced into a second reactor with a moving catalyst bed;

e) at the outlet of the second reactor, the gases are separated from the catalyst and the acrylic acid contained in the separated gases is recovered;

f) the catalyst is returned into the regenerator;

g) the regenerated catalyst from the regenerator is reintroduced into the first and second reactors;

and wherein the catalyst comprises molybdenum, vanadium, tellurium or antimony, oxygen and at least one other element X chosen from niobium, tantalum, tungsten, titanium, aluminium, zirconium, chromium, manganese, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum, antimony, bismuth, boron, indium and cerium.

2. A process according to claim 1, wherein the first and second reactors are vertical and the catalyst is moved upwards by the gas flow.

3. A process according to claim 1 or claim 2, wherein the temperature of the reactors is comprised between 200 to 500°C and preferably between 250 to 450°C.

4. A process according to one of claims 1 to 3, wherein the pressure in the reactors is comprised between 1.01×10^4 and 1.01×10^6 Pa (0.1 to 10 atmospheres) and preferably between 5.05×10^4 and 5.05×10^5 Pa (0.5-5 atmospheres).

5. A process according to one of claims 1 to 4, wherein the residence time of the gases in each reactor is comprised between 0.01 and 90 seconds and preferably between 0.1 and 30 seconds.

6. A process according to one of claims 1 to 5, wherein the regeneration of the catalyst is carried out by heating in the presence of oxygen or a gas containing oxygen, at a temperature of 250 to 500°C.

7. A process according to one of claims 1 to 6, wherein the propylene formed, coming from the gases separated in stage e) and/or the propane which has not reacted are recycled to the inlet of the reactor.

8. A process according to one of claims 1 to 7, wherein the proportions of the elements of the catalyst meet the following conditions:

$$0.25 < r_{Mo} < 0.98$$
$$0.003 < r_V < 0.5$$
$$0,003 < r_{Te} \text{ or } r_{Sb} < 0.5$$
$$0.003 < r_x < 0.5$$

wherein r_{Mo}, r_v, r_{Te} and r_x represent the mole fractions, respectively, of Mo, V, Te and X, in relation to the sum of the numbers of moles of all the elements of the catalyst, with the exception of oxygen.

9. A process according to one of claims 1 to 8, wherein the catalyst corresponds to formula (I) or to formula (Ia) below:

$Mo_1V_aTe_bNb_cSi_dO_x$ (I) $Mo_1V_aSb_bNb_cSi_dO_x$ (Ia)

wherein:

a) a is comprised between 0.006 and 1, inclusive;
b) b is comprised between 0.006 and 1, inclusive;
c) c is comprised between 0.006 and 1, inclusive;
d) d is comprised between 0 and 3.5, inclusive; and
e) x is the quantity of oxygen bound to the other elements and depends on their oxidation states.

10. A process according to claim 9, wherein, in formula (I) or (Ia):

- a is comprised between 0.09 and 0.8, inclusive;
- b is comprised between 0.04 and 0.6, inclusive;
- c is comprised between 0.01 and 0.4, inclusive; and
- d is comprised between 0.4 and 1.6, inclusive.

11. A process according to one of claims 1 to 10, wherein, at least one of the two reactors comprises a cocatalyst corresponding to the following formula (II):

$$Mo_1Bi_aFe_bCo_cNi_dK_eSb_fTi_gSi_hCa_iNb_jTe_kPb_lW_mCu_n \text{ (II)}$$

wherein:

- a' is comprised between 0.006 and 1, inclusive
- b' is comprised between 0 and 3.5, inclusive;
- c' is comprised between 0 and 3.5, inclusive;
- d' is comprised between 0 and 3.5, inclusive;
- e' is comprised between 0 and 1, inclusive;
- f' is comprised between 0 and 1, inclusive;
- g' is comprised between 0 and 1, inclusive;
- h' is comprised between 0 and 3.5, inclusive;
- i' is comprised between 0 and 1, inclusive;
- j' is comprised between 0 and 1, inclusive;
- k' is comprised between 0 and 1, inclusive;
- l' is comprised between 0 and 1, inclusive;
- m' is comprised between 0 and 1, inclusive; and
- n' is comprised between 0 and 1, inclusive.

12. A process according to claim 11, wherein the cocatalyst is regenerated and circulates in the same way as the catalyst.

13. A process according to claim 11 or claim 12, wherein, in the cocatalyst of formula(II):

- a' is comprised between 0.01 and 0.4, inclusive;
- b' is comprised between 0.2 and 1.6, inclusive;
- c' is comprised between 0.3 and 1.6, inclusive;
- d' is comprised between 0.1 and 0.6, inclusive;
- e' is comprised between 0.006 and 0.01, inclusive;
- f' is comprised between 0 and 0.4, inclusive;
- g' is comprised between 0 and 0.4, inclusive;
- h' is comprised between 0.01 and 1.6, inclusive
- i' is comprised between 0 and 0.4, inclusive;
- j' is comprised between 0 and 0.4, inclusive;
- k' is comprised between 0 and 0.4, inclusive;
- l' is comprised between 0 and 0.4, inclusive;
- m' is comprised between 0 and 0.4, inclusive; and
- n' is comprised between 0 and 0.4, inclusive.

14. A process according to one of claims 11 to 13, wherein, a weight ratio of the catalyst to the cocatalyst greater than 0.5 and preferably of at least 1 is used.

15. A process according to one of claims 12 to 14, wherein the catalyst and the cocatalyst are mixed.

16. A process according to one of claims 12 to 15, wherein the catalyst and the cocatalyst are present in the form of pellets, each pellet comprising both the catalyst and the cocatalyst.